DOCUMENT RESUME

ED 356 761 IR 015 981

TITLE	Reports from Western States. Educational Telecommunications Plans, Policies, Programs.
INSTITUTION	Western Interstate Commission for Higher Education, Boulder, Colo.
PUB DATE	Oct 91
NOTE	25p.; Prepared for the Annual Meeting of the Western Cooperative for Educational Telecommunications (3rd, San Diego, CA, October 19-22, 1991).
AVAILABLE FROM	Western Interstate Commission for Higher Education, P.O. Drawer P, Boulder, CO 80301-9752 ($10).
PUB TYPE	Reports - Descriptive (141) -- Speeches/Conference Papers (150) -- Collected Works - General (020)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Computer Networks; *Distance Education; *Educational Technology; Elementary Secondary Education; Higher Education; Information Networks; Library Role; Nontraditional Education; Public Agencies; State Legislation; State Libraries; State Programs; Statewide Planning; *Telecommunications
IDENTIFIERS	Alaska; Arizona; California; Colorado; Hawaii; Minnesota; Nevada; New Mexico; North Dakota; Oregon; South Dakota; *United States (West); Utah; Wyoming

ABSTRACT

This collection of reports highlights the status of educational telecommunications in 13 western states during 1991. Topics addressed include distance education initiatives in Alaska; activities by members of the Arizona Education Telecommunications Cooperative, including colleges, public schools, and government agencies; groups active in the planning and implementation of technology in California education; activities of the Colorado Telecommunications Advisory Commission, colleges, and other organizations in Colorado; the infrastructure for Educational Telecommunications in Hawaii, as well as Department of Education, University of Hawaii, and legislative activities; telecommunications technology in Minnesota public school districts, community colleges, private colleges, the state university system, technical colleges, and the University of Minnesota; legislative initiatives in Nevada and activities of the University of Nevada; efforts by various organizations in New Mexico, including the state library, the board of education, and several colleges; progress made in North Dakota in the areas of interactive television, interactive video, public television, computer networking, satellite broadcasting, and emerging partnerships; legislative policy, networking, community college services, and activities of state agencies in Oregon; the South Dakota Governor's Telecommunication Task Force and uses of telecommunications technology in various educational settings in the state; activities of Utah state agencies and colleges; and initiatives in Wyoming, including legislation, distance education, interactive video, and community college programs. (ALF).

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED356761

REPORTS FROM WESTERN STATES

EDUCATIONAL TELECOMMUNICATIONS PLANS, POLICIES, PROGRAMS

Prepared for the Third Annual Meeting of the Western Cooperative for Educational Telecommunications October 19-22, 1991, San Diego, California

120/594/1

"PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY
Paul Albright

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

ALASKA
Submitted by Barry Willis

With its far flung, multi-cultural population, vast roadless expanses, and diverse needs in both the K-12 and higher education arenas, Alaska has been involved in various distance education initiatives for over a decade. Still, 1991 has been especially active at all levels, with major efforts and pilot projects underway incorporating various technological delivery systems. Whereas past efforts in Alaska often focused on single-technology approaches to instructional distance delivery, recent efforts are characterized by the integration of voice, video, data, and print tools.

SOME HIGHLIGHTS...

During Spring 1991 alone, the University offered over 190 different distance delivered courses throughout Alaska. Interactive television, for example, combining one-way video and two-way audio is being used to deliver a graduate level Masters of Public Administration curriculum to military sites throughout the state. The same system, relying on satellite transmission, is being used to deliver instruction to more traditional learners, as well as Alaska's correctional institutions.

Initiated by the University of Alaska Anchorage and the University of Alaska Southeast, the "LiveNet" system relies heavily on cooperative programming and technical support as well as very competitive transponder rates through a local commercial carrier. In addition to the public administration curriculum, courses in education, history, geometry, literature, and Native issues are being delivered to specific sites throughout the state.

Pre-packaged telecourses, especially popular in Alaska's more urban areas since the late 70's continue to fill an important niche, especially when supported by audio conferencing and strong print components. The University of Alaska Anchorage, for example, often delivers over 20 telecourses per semester to students throughout south central Alaska.

Audio conferencing also remains a pivotal component of Alaska's distance education efforts. With over 250 established audio sites statewide and relying on central, regional, and remotely controlled audio bridging facilities in Anchorage, Fairbanks, Juneau, Bethel, and Kotzebue, the University of Alaska Fairbanks alone, for example, offers over 80 courses per semester to over 100 sites. As with "LiveNet," many of these courses use an integrated delivery approach incorporating print, fax, and electronic mail.

The importance of "student-student" interaction continues to be a critical element of effective distance delivery. To cost effectively link class participants separated by over 1,500 miles, an extensive electronic mail system is in place and centrally managed. And to insure student participation regardless of local facilities, both the University and the Department of Education distribute "lap top" computers with internal modems to students participating in specially designated courses.

While a major benefit of audio conferencing has long been its ease of use, relative cost effectiveness, interactive capabilities, and inherent spontaneity, a major disadvantage has been its lack of an interactive visual component to promote "teacher-student" and "student-student" manipulation of graphic images. This limitation has been especially evident in math, science, and laboratory courses. To fill this "visual gap," various experiments and pilot studies are underway utilizing different multipoint-to-multipoint interactive digital graphics (IDG) technologies such as Optel, Scanware, and Bell-Canada. While the University of Alaska's Bethel campus has been experimenting with the delivery of visual images using the Optel system, the University's computer network is pilot testing the delivery of a math course to rural villages using the Bell-Canada System.

A costly disadvantage of past voice/data distribution systems has been the need to incorporate two lines per site, one each for audio and data delivery. Recently, however, the University's computer network, through its "Alaska Telegraphics Project," has developed a single-line solution in which the IDG data stream "piggy backs"

on the same phone line used for audio conferencing. This is an especially significant accomplishment given the patchwork of phone systems linking Alaskan communities.

Other University efforts have included an instructional tour of a multi-cultural "bush" museum using videodisc and the distance delivery of biology lab courses using hypercard stacks. The hypercard project, along with 12 other distance delivery projects, has been made possible, in part, through grant funding secured from Alaska's largest supplier of commercial telecommunication services.

Additional attention is being placed on long-term distance education planning in the University as it moves towards systemwide course delivery. Towards this end, a statewide study is underway to identify, prioritize, and provide alternative methods for dealing with the myriad policy and procedural issues arising from systemwide course delivery. This project, nearing completion, will be used by the University's Chief Academic Officers to set direction and insure that the distance delivery resources of the University are marshalled to meet specified academic needs.

Alaska's university system is not alone in its emphasis on distance education. The State Department of Education (DOE), charged with delivering statewide K-12 instruction, is an active member of the Pacific Northwest Star Schools Partnership and is working with 35 school districts in Alaska in the installation and use of satellite delivered educational programs and services. By spring of 1992, 81 school sites will be equipped with the satellite and data receive equipment funded through the grant and will be utilizing the services and courses it has made possible. An additional 32 sites, investing in satellite systems prior to the grant, will make a total of 113 Alaska schools with satellite receive capabilities.

In addition, the DOE continues to produce its TALKBACK series. These live interactive video programs rely on satellite delivery to bring experts to students statewide. This same network is used by the DOE for overnight tapefeeds of instructional video materials.

Both the DOE and University system have found that faculty development and inservice training are critical to the long-term effectiveness of distance education efforts. Towards this end, various mentoring programs, workshops, and support services are in place to insure that the distance delivery of instruction remains an effective and viable educational tool throughout Alaska.

Despite the obvious benefits of investing in distance education, Alaskan educators face difficult challenges ahead with a fiscally conservative governor and a legislature besieged with monetary demands growing more strident as Alaska's existing oil fields are gradually depleted.

ARIZONA

Submitted by Art Ashton

Arizona Education Telecommunications Cooperative

During 1990-91, the major activities of the Operating Committee of the Arizona Education Telecommunications Cooperative (AETC) included preparation and work toward passage of draft legislation, hiring a Development Coordinator, and analysis of potential AETC projects that would build toward the establishment of a statewide educational telecommunications network.

The following is a summary of activities submitted by members of the AETC to illustrate how telecommunications technologies are being used to deliver and support instruction throughout the state of Arizona.

Arizona Western College (AWC) has received a Title III Federal Grant for five years which began in October 1990. This grant for $2.5 million will provide the funds for necessary equipment and staff to pursue the goals of interactive television program at AWC. AWC will deliver classes through interactive television to Parker, Arizona beginning in the Fall of 1991. Two microwave towers are being installed between Yuma and Parker. With the installation of these towers, another possible system link is with Mohave Community College in Kingman, Arizona. AWC's San Luis Center is expected to be added to the network in 1992 and general education classes will be offered. The Yuma Proving Grounds are also being planned for expansion of the system in the third year of the grant. The eastern part of Yuma county could then be added as part of the system during the final two years of the grant.

Pima Community College also received a Title III Federal Grant for five years. This grant is to provide funds to develop an intra-college voice and video network connecting the Pima Community College campuses to each other and to the University of Arizona and several of the K-12 institutions in Tucson. The grant also addresses the development of an integrated automated library system and the development of math and science courses to be delivered using telecommunications technologies.

Glendale Union High School District has initiated its $1.2 million fiber optic network connecting all nine of its campuses. During the spring semester of the 1990-91 school year the system was piloted with two classes. The French 6 (3rd level) class involved four schools and fourteen students and the Pascal (advanced computer programming) class involved four schools and twenty-four students, with each student having his own computer. The system was also used for videoconferencing on both planned and impromptu levels, for district-wide broadcast of locally made videotapes and live messages and for interactive staff meetings between three sites at a time. Twelve interactive television classes are planned for 1991-92.

Yavapai County. County Board of Supervisors has made it possible for 12 small rural school districts with enrollment of 600 or less in Yavapai County to receive a basic satellite downlink system. The basic system includes a C/KU band satellite receiver, two 27" monitors, one editing VCR, one regular VCR, and a speaker-phone instrument. The districts receiving these systems are: Ash Fork, Bagdad, Beaver Creek, Clarkdale, Crown King, Hillside, Humbolt, Kirklind, Mayer, Deligman, Skull Valley and Yarnell.

The University of Arizona has established the nation's largest ITFS system in partnership with People's Choice TV. Of the 32 ITFS channels in the People's Choice system, eight will be dedicated to distributing education in Tucson The system will be used cooperatively by the public schools, Pima Community College and the University of Arizona. The U of A also operated VHF and UHF television stations serving Tucson, and the Safford/Duncan area; an AM radio station serving Southern Arizona and an FM radio station with translators in Sierra Vista, Phoenix, and Safford/Duncan. The U of A will begin a new FM station serving Tucson in the spring. The U of A operates a microwave link to deliver live video classes to the Sierra Vista Campus and will install a compressed videoconference system this fall for networking via phone lines to ASU, NAU and elsewhere. The U of A also operates a Ku-bank satellite uplink and both C- and Ku-band downlinks.

Yavapai College has a completely redesigned, re-engineered microwave link between its campuses in Prescott and Clarkdale. The system now involves two independent, separately licensed microwave signals. in the fall of 1990, Yavapai went on-line with two low-power television broadcast stations, one in Prescott and one in Clarkdale, to broadcast telecourses, and the college teaches some audio teleconferenced courses to reach students across its large service area. Audio links exist between the main campus in Prescott and Bagdad, Ashfork, Chino Valley, Prescott Valley, Cottonwood, Mayer and Black Canyon City.

Arizona State University operates a VHF Television station (KAET) and has 4 ITFS channels with 12 frequencies used to link ASU's Tempe campus to ASU West, to the ASU Downtown Center, to 23 corporate sites throughout the Phoenix metropolitan area, and to Dimension Cable in Phoenix, Tempe, Mesa and Chandler and to Insite Cable in Phoenix, ASU also operates a Ku-band satellite uplink as part of its membership in the National Technological University. A microwave link between ASU's Tempe campus and ASU West is

currently under construction. In addition, ASU supports several PictureTel 4000, model 600 compressed video teleconferencing units. The primary function of these units is to provide audio and video communication between the AU Tempe and ASU West campuses on a dedicated 384 KBps microwave link. They also are available for dial-out on the public switched 56 KPbs network.

Northern Arizona University has entered into an agreement with Mohave Community College to establish a duplex microwave connection for interactive video courses to be delivered to a fully dedicated classroom on the Kingman campus. Final arrangements, funding, and circuit construction are expected to be completed during the later stages of this calendar year. Additional expansion of NAU's microwave system is under consideration as well. Active discussions with Navajo community college, Hopi High School, and Greyhills High School in Tuba City have been conducted and funding sources pursued. Northland Pioneer College has also expressed an interest in either joining NAU's microwave system with its own circuit of hosting NAU's circuit at NPC's Winslow campus.

The Arizona Department of Education, in partnership with the Administrative Office of the Courts, has created a Teleconferencing Center in the new State Courts Building in Phoenix. The Center offers compressed video access to the state, nation and world. A microwave link to the Northern Arizona University Flagstaff/Kingman duplex video system provides for a two-way interaction with these sites as well as a path to the NAU C-band satellite uplink. Advanced audio and graphics systems also provide for high quality audio conferencing and the viewing of downlinked C-or Ku-band satellite programming.

Mohave Community College is in the process of completing several projects simultaneously. The construction of a new Instructional Television Pod is now complete. This pod consists of four ITV classrooms and space for four control rooms. Mohave Community College will occupy three of the control rooms and NAU will occupy the fourth by the fall of 1991. The Colorado City project known as "Teleclass North" is also nearing completion. The last of the towers was installed in the first few days of August. This path, once complete, will represent the first microwave path across the western part of the Grand Canyon. The Teleclass North system should be operational by late fall of 1992.

Amphitheater Public Schools reports that students at Canyon del Oro High School and Amphitheater High School in the Amphitheater School District are telecomputing between themselves and with students in other countries through the International Classroom. This is an activity that crosses disciplines and discusses critical global issues such as deforestation of the world's rain forests. In addition to this project, five schools have installed satellite dishes -- Rio Vista Elementary, Copper Creek Elementary, Cross Middle School, Harelson Elementary and La Cima Middle School. These dishes are used to provide staff development and access to ASSET. Other Tucson public school activities include: an integrated school-wide voice, video and data system at Tri Vista and La Cima Schools; connection of several schools to the U of A microwave system; and twenty-nine networked computer systems in place for instructional, administrative and library uses.

The Maricopa Community Colleges have spent the past year expanding links to other institutions in Maricopa County including a high speed data link to Arizona State University and a data link to Phoenix Union High School District. The ASU/MCCCD link is used to provide connection between MCCCD's library system and the ASU library system as well as to provide MCCCD faculty, staff, and students access to BITNET and Internet. The link to Phoenix Union High School District is used primarily to provide data exchange between the two institutions on students co-enrolled in programs for at risk students. MCCCD has also expanded its intercollege video network this fall to include three additional sites. Six colleges and the new District Support Services Center are now connected for two-way video and two-way audio using MCCCD's digital microwave system and NEC's VisuaLink 5000 digital video codecs. These codecs meet international transmission standards at T1 or 1.54 Mpbs transmission, making it possible for MCCCD to begin international video conferencing. Plans are underway to complete the video network by the summer of 1991 when all ten (10) Maricopa Community Colleges will be equipped with digital video codecs.

ASSET, Arizona School Services through Educational Technology, reached participation by 135 school districts enrolling over 300,000 students in its 6th year of service. Over 100 video telecourses, comprising 1,200 lessons, are provided in all of the K-12 curricular areas. Delivery to schools is accomplished via KAET/Channel 8, Phoenix, and KUAT/Channel 6, Tucson. This non-profit corporation is attached to Arizona State University and KAET for fiscal agent purposes and is governed by a Board of Directors composed of participating school superintendents and curriculum administrators.s ASSET course lessons are recorded on videocassettes by participating schools from both daytime and overnight transmissions. Schools located beyond the service areas of the TVC stations and cooperating translators and cable TV systems may duplicate videocassettes circulated by mail.

The Department of Administration (DOA) sought private sector assistance to develop a two-phase strategic direction to meet the telecommunication needs of state government. To that end, Northern Telecomm, Inc. provided a study team to interview major state entitles. NTI, at the request of DOA, met with representatives of five major state agencies, the universities and community colleges to conduct interviews regarding short-term needs and long-range goals. The second phase of the study will consist of a more detailed look at specific ways of meeting the needs and goals identified in the report. The second phase work will begin in October.

DOA has also developed and adopted standards for state data processing and information transfer methods. The first stage is a fiber optic network connecting mainframe centers at the Capitol together in a token ring environment. The mainframe connectivity is scheduled to be completed in September. The second state to follow will extend fiber optic LANS to all buildings on the Capitol Mall. While some details are still to be finalized, the first quarter of 1992 is the target date for implementation.

Interagency Telecommunications Networks, operated by DOA, have added two additional locations connected via T-1 service to the state network. The new locations are Northern Arizona University and ADOT, Tucson. This brings a total of eight locations, six agency locations and two universities, directly connected to the state network. Additional services is planned to Yuma, Winslow, and Safford to expand network capabilities.

The Arizona Department of Education is now operating an electronic bulletin board and electronic mail SINET, USENET, BITNET, ERIC and QERI services to Arizona educators. This can be accessed by almost any PC connected to a modem.

The NSFNET is continuing to grow throughout the state in terms of capacity and numbers of users which include the public universities, community colleges and the K-12 sectors.

CALIFORNIA

Submitted by John Witherspoon

In spite of California's famous budget deficit, 1991 is an important year for the development of educational telecommunications.

In September the Superintendent's Committee on Information Technology submitted its report to Bill Honig, State Superintendent of Public Instruction. The principal focus of this group's work was to recognize and present the case for -- and then define -- the California Education Network, a network of networks that will be designed to embrace education's existing network resources and extend a coordinated system to all areas of the state and all levels of K-12 education, while developing appropriate links to the rest of California education. The committee's report and recommendations were favorably reviewed by Superintendent Honig during a video teleconference on September 26. For details, contact Vincent Madden, California State Department of Education, 721 Capitol Mall; P.O. Box 944272, Sacramento, California 94244-2720.

Among the recommendations of the Committee on Information Technology are provisions for encouraging the development of cable television as an educational resource and the creation of a favorable education access rate in the tariff structure of the state's telephone carriers.

In addition to Superintendent Honig's committee, four other groups are currently active in the planning and implementation of technology in California education. These include:

- The California Planning Commission for Educational Technology. This 19-member commission, established pursuant to Assembly Bill 1470 (1989), is responsible for developing a state master plan for educational technology before January 1, 1992. This master plan is to include the use and integration of educational technology at elementary, secondary, and postsecondary levels.

- The California Postsecondary Education Commission. As required by Senate Bill 1202 (1989), this Commission developed a state policy on the use of distance learning technology in education. The policy was submitted to the Legislature in April 1991.

- The Educational Technology Committee. This committee works with the State Board of Education and the Superintendent of Public Instruction to recommend priorities for public school educational technology funding and to provide specified advice about information technology in education.

- State Allocation Board and State Architect. Pursuant to Assembly Bill 1962 (1989), the Office of the State Architect is required to study and develop recommendations to accommodate computers and other technology in public school classrooms. The study was specified to include recommendations to modify standards for construction of education facilities.

The development of technology in California education remains a difficult and complex matter. Nothing is simple in a state that is fighting its way out of a major deficit and recession while expecting its K-12 population to expand 45 percent -- to 7.1 million students -- by the end of this decade. Nevertheless, there is genuine recognition that technology is an important part of education's future and a significant element in addressing appropriately and creatively the issues that are before us all.

COLORADO

Submitted by Robert Albrecht and Ellen Wagner

Colorado secondary school students and teachers in over 90 school districts (nine BOCES/BOCS) participated in distance learning projects during the past year. Districts are receiving programming via satellite from several sources (Oklahoma State University, TI-IN, Kansas State University) and are originating and receiving programming via several terrestrial networks which include LANs, audiographic systems, ITFS, and T-1 compressed digital video.

The Technology Committee of the Colorado Telecommunications Advisory Commission has created a higher education infrastructure task force which is currently investigating the feasibility of promoting shared connectivity among the graduate and four year institutions through the collaborative expansion of telecommunications infrastructure. Current discussions have considered sharing existing networks, establishing protocols for shared system scheduling and includes looking into collaborative system planning for future system expansion.

The University of Colorado System has continued to expand its distance delivery of courses via the fiber optic network connecting the four CU system campuses. CU's ITFS system (CATECS) continues to serve regional businesses with one way video / two way audio programming offered in the workplace. Efforts are underway to

make greater use of telecommunications technologies to support and to deliver nursing instruction from the CU Health Sciences Center to Mesa State College in Grand Junction and Fort Lewis College in Durango. The University of Colorado-Boulder Journalism Department has been field testing a freeze-frame video course to Western State College; the course has been offered during the spring, 1991 term and is scheduled for future delivery as well.

Colorado State University's national pre-eminence in distance education continues to feature satellite programming through the National Technological University and Mind Extension University, The Education Network. CSU's SURGE program continues to meet the demands of learners through video-taped instruction. CSU is also involved in point-to-point microwave course exchanges with the University of Wyoming, and is a charter member of AG*SAT, a network comprised of over 30 land-grant institutions of higher education.

The University of Northern Colorado compressed video network continues to connect UNC with Mesa State College in Grand Junction and UNC's Denver Center in central Denver. Significant network development is being planned for the 1991-1992 academic year.

The State Colleges in Colorado have been involved in a variety of collaborative telecommunications projects during the past year. Sample projects include (but are not limited to) Western State College's collaboration with the University of Colorado-Boulder to receive a freeze-frame video journalism course from the Boulder campus. Mesa State College is currently connected to the University of Northern Colorado campus in Greeley via a compressed video link carried over a DS1 terrestrial copper network. Metro State College's access to the CU fiber on the Auraria campus has provided a gateway from program delivery for which plans are currently being developed.

Adams State College has been actively engaged in the development of a switched 56kbps x 2 compressed video network. During the past year a pilot project connecting ASC with the University of Northern Colorado was conducted to field test the feasibility of using compressed video for meetings and for course delivery. Adams State College is currently collaborating with the University of Southern Colorado using a switched 56kbps x 2 system for course delivery and for administrative applications. Three courses are scheduled for delivery on this system during the fall term. One course is currently being delivered via a computer bulletin board at Adams State College, with other courses being designed for delivery during the spring term.

Colorado Community Colleges and Occupational Education System projects have included the expansion of the Morgan Community Colleges system. Morgan Community College is also actively involved in integrating Instructional Television Fixed Service into its long range technology planning. Red Rocks Community College was the recipient of a significant Title III grant which is being used to develop a compressed video distance education network. Pikes Peak Community College has greatly expanded its distance learning activities and is currently employing ITFS as an instructional delivery option. Trinidad State Junior College is delivering nursing courses to Alamosa via audiographics. The Telecommunications Cooperative (TeleCo-op) continues to provide leadership for CCCOES and other state institutions in the area of distance learning. Currently efforts are underway between TeleCo-op and KRMA-TV to make use of vertical blanking interval transmission via broadcast television for audiographic program delivery.

The Western Colorado Center for Planning and Professional Development has coordinated the purchase of an 8 port Tempo MBX Audio Teleconferencing System to be used collaboratively by western Colorado educational institutions. These institutions include four year colleges, community colleges, vocational and technical education centers, K-12 schools and school districts, as well as other state agencies. A needs assessment was conducted in anticipation of developing telecommunications solutions for western Colorado; these data were used to develop distance learning workshops in the summer of 1991, and has been shared with the Technology Committee of the Colorado Telecommunications Advisory Commission to encourage more efficient statewide telecommunications planning efforts.

Mind Extension University was responsible for coordinating the Colorado 2000 Communities Initiative statewide teleconference on June 17, 1991. The Colorado 2000 initiative was undertaken by Governor Romer's staff during Spring 1991, and involved teams educators, community representatives students and parents in developing resources and strategies for addressing the six national educational goals The Communities Initiative Teleconference involved 176 downlink sites around Colorado, with audio and full motion video returns at selected sites around the state. An hour long video program was developed for used as the "wraparound" for the teleconference. The teleconference was cablecast via Jones Intercable and could be seen at sites throughout the United States.

Access Colorado (a project of the Colorado State Library which is looking to establish an on-line data resource available via local calls throughout Colorado) has been the recipient of several grants and has distributed "request for information" regarding the system design necessary to support their interactive information network. Colorado Supernet has been involved in preliminary discussions with Access Colorado to provide network access and support.

Pacific Mountain Network hosted "FarView 91" in January of this past year. This interactive satellite program provided viewers around the country with information about a variety of distance learning issues and services.

HAWAII

Submitted by David Lassner

1991 has been characterized by maturing implementations of new systems reported on in the past, along with continuing planning and implementation of new systems. First, it is worthwhile to quickly review some of the most important unique characteristics of the state as they relate to educational telecommunications.

Like many of the western states, Hawaii faces huge problems of geographic dispersion of our population. Some 80% of the state's million-plus population lives on the island of Oahu, while the island of Lanai has under 3000 residents. Providing equal access to educational opportunities throughout the state is obviously a tremendous challenge. Hawaii is also unique in that both lower and higher public education are directed on a statewide basis. There is a single Department of Education with 238 schools providing K-12 instruction throughout the state, and a single University of Hawaii system with 10 campuses including community colleges, baccalaureate granting colleges, and a major research university.

Infrastructure for Educational Telecommunications

HITS. The Hawaii Interactive Television System (HITS), a service of the Hawaii Public Broadcast Authority, provides inter-island video services for the University, Department of Education, State Agencies, and others. Point-to-point analog microwave carries full motion video signals between the major islands, with ITFS distribution to some schools and hospitals.

Five University campuses on four islands are also interconnected through HITS for limited two-way video programming. Agreements with cable television franchises provide one-way connectivity to many locations not served by HITS. Although not itself new, the Maui Community College Skybridge system, which provides one channel of full-motion two-way interactive video among the islands of Molokai, Lanai, and Maui, has been interconnected with HITS.

HAWAIIAN. The State of Hawaii has developed the Hawaii Wide Area Integrated Information Access Network (HAWAIIAN) as part of its Strategic Program Initiative for Telecommunications and Computers. HAWAIIAN consists of an inter-island digital microwave communications backbone and an emerging intra-island synchronous optical network (SONET) system, with voice, data, and T1 videoconferencing services carried over these

transport mechanisms. The network is managed by the Information and Communication Services Division (ICSD) of the Department of Budget and Finance, and capacity is made available to governmental agencies.

HAWAII FYI. This year the State of Hawaii unveiled Hawaii FYI, its new information services gateway. Hawaii FYI provides access to government information systems, a new legislative information system, public and University library systems, videotex (NAPLPS) informational materials, chat lines, bulletin board systems, and soon, private information sources. FYI was started as part of an initiative to encourage the development of an information industry in Hawaii. The gateway itself is operated by the ICSD, and a new quasi-governmental entity called the Hawaii Information Network Corporation, or Hawaii INC, is responsible for marketing the system.

Olelo: The Corporation for Community Television. On Oahu Olelo: The Corporation for Community Television began active operation. This is a new non-profit corporation established to support public, educational, and government (PEG) access programming under the terms of cable television refranchising agreements. The current single PEG channel is expected to expand to three channels soon, with up to seven channels available for PEG programming over the 15-year term of the franchise agreements. Under contract with Olelo, Leeward Community College provides training and support for community programming.

Department of Education Activities

This year the Department of Education (DOE) filled the new position of Assistant Superintendent for the Office of Information and Telecommunications Services. This consolidates management of computing, telecommunications, distance education, and instructional television. Major ongoing statewide activities include:

Teleschool. So far, three courses have been implemented for statewide delivery to students by television: AP Calculus, Analytic Geometry, and Elementary Science. Delivery takes place via HITS, cable television, and sometimes delayed viewing of tapes.

Inservice Training. Similar technologies are used for inservice sessions offered statewide in the evenings. Sometimes, national videoconferences are downlinked for inservice training, with or without local inter-island wraparounds.

Information Retrieval and Videotex. Every public school in the State is now equipped with at least one videotex terminal, modem, and phone line. These are heavily used for retrieval of information from local and national databases, electronic mail, and access to curriculum-based online networks.

University of Hawaii Activities

The University of Hawaii completed a new strategic plan for information technology. Implementation of the recommendations will take place over the next several years. Major current activities include:

Instructional Television. The University is the primary user of HITS, with over 50 credit courses offered during the first year of operation. These focus on areas of state need, such as Nursing, Education, and Allied Health, but programs are also offered in Library and Information Studies, Telecommunications and Information Resource Management, and Public Health. Electronic mail, computer conferencing, and specialized library support are available to students in these classes. Credit courses are also offered by community colleges via cable television on three islands.

Integrated Voice/Data/Video Network. The development of an integrated intercampus network for voice, data, and video is now under way. Using state initiatives such as HAWAIIAN and HITS, cable franchise agreements, and leased lines when necessary, the University is implementing a statewide multiple-T1 network for its internal communication. This will also interconnect the University with state agencies for sharing of information

resources.

PACCOM. The University of Hawaii serves as principal investigator for PACCOM, the Pacific Communications Network that provides connectivity into the Internet for Japan, Korea, Australia, and New Zealand. The number and bandwidth of PACCOM links continues to increase.

PEACESAT. This year also marks the re-emergence of PEACESAT, the Pan Pacific Education and Communications Experiments by Satellite. Now operational on NOAA's GOES-3 satellite, PEACESAT uses S-band technology to provide 9 half-duplex audio channels and 3 full duplex channels capable of supporting 9600bps modems. With a footprint encompassing the entire Pacific Basin, these facilities are available for education, training, and emergency response.

Statewide Library Automation. In 1991 the University of Hawaii at Manoa cut its operations over to the Colorado Alliance of Research Libraries (CARL) library automation system. As the systemwide data network develops, all campuses of the University plan to move to a consolidated library information system. The University of Hawaii is collaborating with other members of the CARL consortium on the mainland, is actively pursuing use of the system to support distance education students, and is working on an image storage and retrieval system for preservation and distribution of historic photographs.

Legislative Activities

After several years of legislative sessions with a relatively high level of activity relating to telecommunications, 1991 was relatively quiet. Funding for expansion of the HITS service area and for limited additional two-way video capability was provided to the Hawaii Public Broadcast Authority. In the policy area, a bill was introduced in the State House to create a Statewide Telecommunications and Information Technology Advisory and Policy Council.

MINNESOTA

Submitted by Joe Graba

Telecommunications activity varies greatly by educational system in Minnesota. Following is a brief description of the present situation in each of the systems as well as a brief discussion of future plans for expanded use of telecommunications technology.

Minnesota K-12 Public School Districts

Many Minnesota K-12 school districts are involved in interactive communications networks. From the very first consortium in 1980, the operating clusters of networks linking K-12 districts have grown to accommodate 162 districts, with more networks on the planning board. The operational sites represent more than 35% of the total number of school districts in the state, with the planned networks raising that percentage to more than half of the districts in the state. Many of the early consortiums were designed around microwave technology, primarily ITFS and point-to-point, and coaxial cable. Today, the preferred technology is fiber optics technology in the analog frequency.

The K-12 network consortiums were first developed to address low-incidence classes coupled with declining enrollments in the rural areas. Then they began addressing increased state mandates on districts to improve their science, math, language, and vocational course offerings. The lack of teacher resources in some program areas also became an issue which could be addressed by the networks. Finally, when post-secondary open enrollment options became a reality, the schools tied into networks could more easily serve their students with post-secondary courses without having to physically send them to a campus site. Networks that are linked with a

post-secondary campus cause options courses to become even more viable for both the students and the post-secondary teacher.

Minnesota Community College System

The Minnesota Community Colleges are using telecommunications in the areas of teleconferencing, two-way interactive television, and date transmission. All of the 20 colleges of centers have satellite dishes and are involved in the promotion of teleconferences primarily for continuing education activities.

Two-way interactive television is currently being used by eight of the colleges. The primary utilization for the two-way interactive television is to provide college classes for area public schools, technical colleges, and to other community colleges. The public school classes are a part of Minnesota's Post-Secondary Options Program for high school juniors and seniors. The classes being transmitted to the technical colleges are usually the general education classes that are a part of joint career programs between the community colleges and the technical colleges. Specialty classes are shared between community colleges to provide a broader curriculum and to improve the instructional efficiency.

Libraries in the community colleges are linked to each other, as well as to other academic libraries, through the Minnesota State University automated library catalog network.

Private Colleges

With respect to telecommunications, the 16 colleges are steadily increasing the scope and utilization of communication networks. There is a growing interaction of voice, data, and video transmission within campuses and between other private colleges, communities, state agencies, and other public higher education institutions.

The major application areas for existing private college networks include:

- o data transmission for faculty research and development, E-mail, and remote access to facilities unavailable on campuses; and
- o voice transmission for voice mail on campus, and one-way video-voice return

Currently, most of the private college networks link facilities within a single campus of link two campuses in close proximity, such as Carleton and St. Olaf Colleges to Northfield or the College of St. Benedict and St. John's University near St. Cloud. There are some remote networks as well, such as between the College of St. Catherine and St. Mary's College.

In addition to these campus networks, seven of the private college library catalogs are linked via CLICNET, which collectively holds listing of more than two million volumes. There are also a growing number of telecom linkages between public and private colleges. An example would be the Gustavus Adolphus and St. Olaf Colleges participation in the Minnesota State University automated library system.

Twelve of the private colleges are connected or planning to connect to the Minnesota's Regional Network (MRNet), hubbed at the Minnesota's Supercomputer Center. MRNet links public and private institutions and provides date transmission for education research and development.

As with the public systems, the structure of the networks varies considerably, from inexpensive facilities which are wholly owned, to complex facilities which are leased. Facilities are maintained both through internal resources and via maintenance contracts with outside vendors such as AT&T. Transmissions are both in analog and digital form. Most networks are available for use 24 hours a day, seven days a week.

Minnesota State University System

The Minnesota State University System serves approximately 64,000 students at seven universities in Minnesota and a new campus in Akita, Japan.

Over the past several years each of the universities has been involved in developing a regional two-way broadband/narrowband interactive educational television system in cooperation with K-12 districts and post-secondary institutions. Using a combination of state, federal, and private funding, each campus is purchasing ETV equipment and building interactive studios. The regional system over which collegiate level or high school courses are taught uses a combination of optic fiber and microwave. Off-campus classes are being taught via ETV at six of the seven universities.

The Minnesota State University System is currently working on two tracks: (1) increasing each university's program and broadcast capability, and (2) cooperating with other Minnesota state agencies in developing a statewide telecommunications network (STARS). It is apparent that two-way broadband/narrowband television is a powerful educational tool that will be used by the Minnesota State University System.

The State University System maintains an automated library catalog and circulation system. It links all six campus libraries to each other as well as to all community college, several private college libraries, and North Dakota State University.

Minnesota State Board of Technical Colleges

The Minnesota State Board of Technical Colleges (MSBTC) is committed to the development of a statewide voice/video/data interactive communications network linking each of the 34 college campuses and the state board offices. Communications links with other Minnesota institutions and sites beyond Minnesota are also a priority with this system. The technical colleges currently have three regional audio/video/data interactive fiber optic networks operational, and one regional network under construction. In addition, six computers are linked into separate K_12 or other higher education interactive communications networks and two campuses are linked into correction facilities. The consortia also cooperate with other K-12 and/or higher education networks and are technically capable of interfacing with these networks to expand their communications even farther. The current operational networks involve 22 sites. The remaining 12 sites are involved in plans for developing their regional networks. The MSBTC is also working with the Department of Administration and other educational institutions on a project which would transport information among the regions and providing for total statewide fiber optic interactive connectivity.

In addition to the fiber optic links being developed, the MSBTC participates in a joint powers effort with the Minnesota World Trade Center (WTC) and the St. Paul Technical College campus to operate a Ku-Band satellite uplink broadcast and production facility called MnSAT. Working with each of the 34 technical college campuses that have downlink capability, the combined effort provides satellite uplink/downlink and production service primarily for Minnesota government and educational entities, as well as WTC clients. The link with the World Trade Center enables MnSAT to facilitate multi-state, national and international teleconferences in addition to those which target only Minnesota sites. Recently, the MIDTEC fiber optic network, located in the central region of Minnesota, has linked into the St. Paul Technical College campus. MnSAT interfaces with two regional fiber networks, enabling fiber network sites to broadcast via the satellite uplink.

The technical college fiber optic networks are used to provide daily classes including general education courses, courses from programs a particular campus specializes in apart from other campuses in the consortium, AAS courses secured from nearby community colleges and/or universities, shared courses, and customized service training courses. The networks are also used for teacher meetings, administrative meetings, registration procedures/information sessions, and general information or workshop sessions. MnSAT is used for major workshop sessions, training sessions, information dissemination, and situations requiring dissemination to a larger

number of people who are dispersed throughout a large geographical are.

University of Minnesota System

Planning for instructional telecommunications within the University of Minnesota System is coordinated through the Office of Academic Affairs. Systemwide input is facilitated by an Instructional Telecommunications Working Group, which is currently assisting the Office of Academic Affairs in the development of a strategic plan for instructional telecommunications.

The University of Minnesota has used broadcast and cable television to provide access to graduate and undergraduate courses; additional undergraduate coursed are available by radio and by audio and video tape. The Institute of Technology provides complete master's level programs in several disciplines via UNITE, a one-way video/two-way audio (microwave) system in the Twin Cities and Rochester. These UNITE courses are also distributed by the National Technological University (NTU).

The University of Minnesota is a founding member of AG*SAT, which parallels NTU in the agricultural and life-sciences disciplines. In addition, the Minnesota Extension Service (cooperative extension in Minnesota) is establishing a network of satellite receivers to obtain AG*SAT (and other) satellite programming.

An interactive compressed video (ITV) network has been piloted between two campuses of the University with expansion to all coordinate campuses and Rochester in the planning states. This network will link the University of Minnesota to K-12 sites and other post-secondary institutions in Minnesota. The University of Minnesota has also been an active participant in the planning for STARS, a broadband and geographically comprehensive telecommunications network which will serve the needs of government and education in Minnesota.

All campuses and sites are connected by two data networks, one academic and one administrative. These networks connect university sites to one another and to other sites in Minnesota, across the nation, and in other countries.

Summary

Over the past three years our state Department of Administration has been planning for a statewide telecommunications network that would involve an integrated digital system providing for voice, data, and video transmission. This system is called STARS. The responses to the Request for Proposal for this system are currently being reviewed. d The system will provide for a rather extensive statewide system for voice and data transmission. While almost all of the education systems in our state are using broadband video transmission from some of their campuses it is unlikely that the STARS system will provide broadband transmission capacity. However, the system will include video conferencing capability through the use of compressed video.

NEVADA

Submitted by James Williams

Legislation was introduced this year to upgrade Nevada's state-owned, but aging analog microwave system. The proposal would have provided a multiple T-3 loop around the state with the capacity to serve all of state government, higher education and K-12. The bill did not survive the legislative session. However, an agreement was reached between Governor Miller and the telephone companies to provide greater capacity between the major metropolitan areas as well as to some rural locations. This agreement is still being finalized but should allow new, high-bandwidth digital circuits for various communications needs.

The Legislative Council Bureau, with the cooperation of the State Telecommunications Advisory Board, Nevada Bell and Centel, inaugurated a video-conference system during the 1991 legislature. The system, which employed compressed video equipment from CLI and leased terrestrial circuits, provided southern Nevada citizens with their first opportunity to participate in the legislative process without travelling to the capital in Carson City. This system has subsequently been purchased by the State of Nevada and will continue to supply video-conference services between Carson City and Las Vegas. While its primary purpose is to furnish conference capability for the legislative process, it will also be made available to state agencies and education. The Nevada Legislature will not meet in full session during the coming year.

In addition, the University of Nevada System pledged to purchase and initiate video-conference services between its population centers in Reno and Las Vegas. This system is expected to be functional by November of this year. It will provide conference services for the administrative needs of the System and allow exploration of other applications and networking alternatives. We anticipate further videoconferencing growth during the coming year.

The University of Nevada System began an initiative to provide more on-line library resources to citizens throughout the state. The project will included an evolving number of database resources and will be available to the growing number of NevadaNet users. Long range plans include access by public libraries and K-12 institutions.

NEW MEXICO

Submitted by Art St. George

Regarding efforts statewide of the libraries, a Union List of Serials on CD-ROM, including the serials holdings of 18 academic, school, special and public libraries, has been distributed by the New Mexico State Library to librarians throughout New Mexico. The Union List is an important component of statewide interlibrary loan programs in which libraries of all types are electronically connected. Also, the New Mexico Consortium of Academic Libraries is studying how to interconnect the various state library networks.

By agreement with the Corporation Commission and the Commission on Higher Education of the State of New Mexico, US West has undertaken to construct a statewide, high-capacity digital network for education, specifically, the institutions of higher education. By the end of 1990, various tasks in planning, needs assessment and preliminary technical designs were completed. In 1991, additional tasks of infrastructure, product evaluation and service trials will be completed. The final network implementation should be completed by the end of 1992.

In December of 1990, the New Mexico State Board of Education and the Commission on Higher Education joined forces to establish the New Mexico Education Technology Planning Committee (ETPC). The ETPC was created to develop a long-range strategy to maximize state resources in educational technology. The ETPC is comprised of representatives of the educational community, legislative staff, national laboratories, private industry, libraries and museums. The strategic directions are:

- Partnerships - forge public-private sector partnerships;
- Telecommunications - complete the statewide educational telecommunications network;
- Training - train and support teachers and faculty; and
- Technology in the schools - establish a systemic process for change in utilizations of educational technology.

At the University of New Mexico, the College of Education's RN-BSN degree completion program is the largest ITV one of its kind in the nation. It currently offers 10 courses (29 credits) with eight of these being televised to sites across New Mexico and in Southeastern Colorado and covers an area of 180,000 square miles.

The New Mexico Military Institute is now producing a monthly program for the Community College Satellite Network entitled "For the Prime of Your Life." This program is designed to provide information for persons preparing for retirement and the retired. It is the only program of its kind now being broadcast from New Mexico for a national audience. The Institute plans to host a teleconference on "The Lure of the Southwest" and sponsored by the Satellite Network. The Institute supports its academic programs in part by the use of a downlink from the School and College Satellite Network.

San Juan College will be constructing an ITFS system and will have it completed by the end of August, 1992. Four area school districts have signed letters of intent to participate by having receive sites. TCI Cablevision recently extended service to the College and will allow the College to backfeed telecourse broadcasts on a cable channel provided to the College by TCI. When wiring is complete, the College will also be able to distribute cable programming on campus.

The University of New Mexico (UNM) will launch its second year of the New Mexico Supercomputing Challenge, a statewide contest among teams of high school students. In cooperation with New Mexico Technet, the National Laboratories and the private sector, this contest last year attracted 235 students from around the state who competed for a first-place prize of a DEC $50,000 workstation, in addition to college scholarships and savings bonds. We anticipate even more teams this year.

New Mexico Technet provides the statewide communications access to supercomputers at the National Laboratories. UNM's Associate Vice President for Computing and Information Resources and Technology, John Sobolewski, is working with the Educational Technology Planning Committee to develop a statewide educational network. UNM is also announcing its new campus-wide information service to provide the state with access to online information ranging from class schedules to calendars of cultural events.

New Mexico Technet continues to expand its services to the State in a number of areas. In education and business, it has made available the Border Trade Network which gives users access to specialized academic and business databases on the border area as well as Mexico. Included is a detailed directory of over 200 maquila plants. Also available on this network is the Latin American Database, the most comprehensive online news service available covering the news in Latin America, Cuba and Mexico. On the educational front, Technet expects soon to make the Guidance Information System available on a pilot basis to a small number of New Mexico schools. Technet is pioneering the use of a network-based license and service for the GIS publishers. Also coming online soon is a teacher availability/job vacancy database serving the state's K-12 community.

NORTH DAKOTA

Submitted by Russ Poulin

Educational telecommunications moved from a planning to an implementation stage during the past year. Significant progress was made throughout the state in adapting a wide range of technologies.

Legislation/Educational Telecommunications Council

The 1991 legislature defeated bills to deregulate phone lines, establish new certification requirements, and change membership in the statewide coordinating body, the Educational Telecommunications Council (ETC). More than $5 million over the next two years was appropriated to ETC to aid public broadcasting, support pilot projects, and provide competitive grant funding for K-12 technology consortia. An additional $1.2 million will support the North Dakota Interactive Video Network.

K-12 Interactive Television

The ETC encourages school districts to cluster together to share educational technologies. Two clusters using interactive television were previously operational and three more will come on-line during the current academic year. The goal of the ETC is to have every school district participating in a network in the near future. Many school districts are preparing grant applications for the ETC's current round of funding.

North Dakota Interactive Video Network

The North Dakota University System, the North Dakota Information Services Division, and the USDA Rural Health Project formed a partnership to create a statewide compressed video network. The primary goal of ND IVN is to "deliver quality postsecondary programs and services to citizens who would not otherwise have access to these services." Usage by state agencies, the extension service, and professional organizations for meetings and seminars has dramatically increased.

IVN will grow to 14 sites in December 1991, networking all public supported campuses and the State Capitol. Future expansion to other state government sites and to K-12 clusters is in the planning stages.

Prairie Public Television Foreign Language Project

Many North Dakota schools are very rural and are several years from being networked in an interactive television cluster. This August, Prairie Public Television began offering a Spanish language class through broadcast television. The course is locally produced and funded by the ETC. More than 350 students in 30 high schools are enrolled. Both Spanish I and Spanish II will be offered next academic year.

Computer Networking

The ETC funded an experimental K-12 computer network (SEND-IT) in the southeast region of the state. The network supports teacher and student interactions through electronic mail and bulletin boards. Project members also participated in international networking through AT&T's experimental learning program. Much of the funding is used to support teacher training on computer networking. ETC has provided funds to expand the network to the northeast quarter of the state this year and plans to cover the rest of the state next year.

Satellite

Nine school districts receive courses in Japanese, Russian, Probability, Astronomy, Marine Science and others through satellite. SERC (Satellite Educational Resources Consortium), TI-IN, and ASTS all provide course work to North Dakota high schools.

Emerging Partnerships

Although still in the conceptual stages, many promising discussions are underway:

- o Minnesota, North Dakota, and South Dakota are considering a tri-state consortium to apply for star schools funding.
- o The North Dakota Library Association is exploring the University of Arizona graduate librarianship program.
- o North Dakota's tribal colleges are interested in cooperating to increase offerings to their students.
- o Talks of sharing expertise with Manitoba and Saskatchewan are just beginning.

OREGON

Submitted by Ray Lewis

Legislative Policy

In its 1991 session, the Oregon Legislature liberalized K-12 distance learning policies to permit faculty who teach at accredited colleges and universities to teach distance learning courses in Oregon without being a certified K-12 teacher. This will make it easier for colleges and universities to sponsor programs for K-12 students.

Oregon ED-NET

Legislative Action. Oregon ED-NET's initial funding was released by the legislature in July 1990. During the 1991 session the legislature approved the Governor's recommended funding for the 91-93 biennium. The total amount approved for ED-NET is $7.6 million. The rest of the agency's revenue must come from membership and user fees.

Organizational Developments. Since September 1990, Oregon ED-NET staff has increased from 2 to 8 and is also supplemented by consultants. Oregon ED-NET now has a membership of 131 organizations in the following categories:

K-12 Schools	61	State Government	8
Community College	15	Medical Facilities	10
Higher Education	12	Professional Assoc.	3
Business	11	Educ. Service Dist.	9
Other	2		

Technical Developments.

- Network I (Analog Video). Since August of 1990, Oregon ED-NET has installed 91 Network I downlinks and continues to add others. After the completion of its permanent uplink later this month (October 25th), Network I will expand from one to two channel capability.

- Network II (Compressed Video). After months of delay, Network II has its first 7 sites up and operating with plans for 30 sites by December 1991 with 9 more to follow. The Network II contract has been assigned by the original contractor, Miralite Communications to GTE Spacenet Corporation.

- Network III (Computer Access to Data). Implementation is underway with initial operation planned for January 1991. The network will provide computer/modem access to bulletin boards, conferencing, data bases and libraries.

Programming. Over 300 hours of programming already have been delivered over ED-NET and the schedule is rapidly expanding. Of special note is a series of 20 programs scheduled for November in which Governor Barbara Roberts will use ED-NET to conduct statewide town-hall meetings with up to 20,000 citizens as part of an effort to reform the state's tax structure.

Oregon System of Higher Education

OSSHE had been awarded an Annenberg/CPB New Pathways grant of $300,000 to support the development and delivery of three degree programs over Oregon ED-NET. The degree programs are nursing, agri-business and liberal studies. Jon Root of Oregon State University and Holly Zanville of the Chancellor's Office are the

project directors.

The OSSHE system has determined that degree programs will have priority over other academic programming over Oregon ED-NET. They have also developed policies and procedures for the approval of degree programs delivered over the network. In addition. OSSHE institutions have developed a common registration form for all higher education students taking courses over ED-NET. All eight institutions have or are developing classroom/studio facilities for distance learning and many faculty have taken advantage of training workshops at OSU.

Office of Community College Services

The Oregon Community College Television Consortium continues to offer an average of 15 video telecourses per term over Oregon Public Broadcasting. Some colleges also offer telecourses over their local cable systems. In addition, individual community colleges offer live, interactive courses over Oregon ED-NET.

Portland and Chemeketa Community Colleges also deliver live interactive programming over ED-NET and their respective ITFS systems.

Oregon Department of Education

As a participant in the Northwest Educational Telecommunications Partnership, ODOE received second-round Stars Schools funding for an additional 38 sites plus administrative and programming support. In addition, ODOE is sponsoring 3 student instruction and 9 staff in-service programs over Oregon ED-NET.

State Agencies

Many state agencies are using the resources of colleges, universities and K-12 schools to originate and receive training programs and meetings over Oregon ED-NET. The level of cooperation has been exceptionally high, but arriving at fee structures that are acceptable to everyone involved is a challenge.

SOUTH DAKOTA

Submitted by Warren Wilson

Telecommunications technology is used to varying degrees within South Dakota's educational settings. On the high end there is one classroom setup for two-way audio and video. Extensive use of audio and data communications exists. These types of communication are utilized by elementary and secondary schools, higher education, post-secondary vocational, community colleges, continuing education, and employee retraining.

One exciting development this past year has been the Governor's Telecommunication Task Force. This group represents a cross section of constituents from the Office of the Governor, Bureau of Administration, Department of Education and Cultural Affairs (kindergarten through high school), Bureau of Finance and Management, Board of Regents (higher education), State Legislature, unified Judicial System, local government, business and industry, and service organizations. The Task Force began with the needs identified in the South Dakota LIVE Net project. Additional users were interviewed within the State. A report has been developed and sent to Governor Mickelson outlining the many telecommunication needs and resources within the State. Features of the proposal are:

- Geographically equal service throughout the state
- financially self-sustaining after the initial capital investment
- services all levels of education
- national and regional exchange of educational courseware

- economic development with public and private sector involvement
- multi-technology solution (hybrid terrestrial/satellite model)

By merging the technologies of fiber optics, advanced telephone system capacities, and satellites, it is possible to develop a hybrid state network which can easily reach any corner of the state with either one-way or two-way interactive video on an affordable basis.

Another planning activity, which has been continuing, is based upon the cluster concept by nine northern school districts. These districts are discussing a system whereby they could pool teacher expertise and have the capability to deliver a program to any site.

All of the libraries at the public and private higher education institutions, the city and county libraries, and the State Library share a common system, the South Dakota Library Network (SDLN). This system is a data network based upon a mainframe computer located in Spearfish on the campus of Black Hills State University.

South Dakota Public Broadcasting provides statewide radio and television services. SD Public Radio provides a Talking Book Service on its SCA channel for the visually impaired. South Dakota Public Television offers PBS programming, local productions, Instructional Television, an Overnight Service, university telecourses, closed captioned programming for the hearing impaired, Infotext and DakotaText services for agricultural marketing and production (in conjunction with the Cooperative Extension and SDSU), and professional teleconferences. Other satellite programming can be received and be shown in a studio, taped, or rebroadcast. South Dakota Public Television initiated a Learning to Learn project in September 1991. This project is intended to encourage accomplishment of the #1 Presidential Education Goal, School Readiness. SD Public Broadcasting is one of 26 PBS licensees in the nation implementing the Sesame Street Preschool Educational Program.

Elementary and secondary education uses the following:

- South Dakota Science Network, a microcomputer based system at SDSU, for science and math teachers
- Schools Without Walls system, allows user schools to interconnect via E-MAIL, audio conferencing, and on-line conferencing through microcomputers
- Audio Graphics, a system permitting users to interconnect through microcomputers, scanners, plotters, and interactive voice (Industrial Technology Telecommunication Cooperative (ITTC) [two-way interactive graphics/audio/freeze frame video] between Northern State University in Aberdeen, Elk Point, Ethan, and Vermillion school districts)
- Bennett County receives 6 subjects in a project with 27 other states
- BIA satellite project joins 16 schools across the nation (4 of which are in South Dakota)
- National Native American Tele-Teaching has 5 sites in South Dakota
- Commercial sources: Channel 1, NBC, ABC, and CBS
- Non-commercial sources: ITV, Arts and Entertainment, PBS, CN News, and the Discovery Channel
- One-way video and two-way audio return

Higher education serves various communities within the state. South Dakota State University, in partnership with South Dakota Public Broadcasting, initiated delivery of two way video interactive distance education with Capital University Center in Pierre. These broadcasts utilized South Dakota Public Broadcasting's microwave system. A variety of demonstrations and meetings were also held on the system including a demonstration to the Governor's Task Force on Telecommunications. In the Fall of 1991, it is anticipated that the SDSU-CUC link will be converted to a digital system. The four classes and other activity on the system will be operating on a T1 circuit involving a local telephone company, AT&T, and US West. Conferencing is also done via the State Telephone Network and the Higher Education Computer System (HECS) data network. Through the HECS network, students, faculty, and staff can communicate (via electronic mail) with colleagues throughout the United States and internationally. Limited networking is also done through the State Data Network.

The South Dakota Medical Information Exchange (SDMIX), administered by the University of South Dakota's Medical School, has 27 rural teaching sites and 4 major campuses. Its goal is to retrain rural medical personnel (e.g. physicians, nurses), and to add greater responsibility in the Indian health care deliveries. The system is composed of strictly audio telecommunications. The system is sold nationally, which provides its total funding.

State-Wide Educational Services (SWES) has been actively involved in various telecommunications efforts. These efforts include ongoing programming for the University of South Dakota Telecourses, as well as research, planning, and development activities focused on the construction and implementation of interactive telecommunications classrooms. The University Telecourses program provided 30 telecourses to over 1,000 distance learners during the 1990-91 academic year.

Mitchell Vocational School has extensive satellite capabilities. Facilities of sufficient quality to meet national network television requirements are available on-site. Not only does the School have the technical capabilities for satellite communications but can also train the technicians to plan, implement, and maintain these types of systems.

This past year many planning efforts have been focused by the Governors' Telecommunications Task Force. The next year holds much potential in terms of growth in the communications arena. Hopefully, funding can be arranged to bring these labors to fruition.

UTAH

Submited by Don Carpenter

The Utah Telecommunications Cooperative was expanded in 1991 to include not only representation from state agencies, higher education, and public education, but also from private exchange carriers, telephone managers, US WEST Communications, the Governor's office, the Public Service Commission, cable television, and city and county officials. The Cooperative remains a voluntary council that meets monthly to share information and coordinate technical and policy matters affecting the telecommunications infrastructure of the state.

The State Division of Information Technology Services was created in 1990 to consolidate two state agencies--one for data processing and one for telecommunications, including networks for public safety. Educational telecommunications, however, continues to be governed by the State Board of Regents and State Board of Education.

Senate Bill 116 was passed during the 1991 Legislature requiring the preparation of a report by the Public Service Commission to the Governor describing the effect that any plan to create, upgrade, or significantly expand state-owned or state-funded telecommunications networks might have on telephone rate payers.

Utah operates a two-way interactive audio/video closed circuit microwave network called EDNET, which currently connects 21 studio and classroom sites across the state, including all nine public colleges and universities. EDNET delivers a wide range of K-12 and college-level courses, and last year served more than 1,100 students with 3,805 programming hours. Numerous conferences and planning meetings are also conducted over the EDNET system for public and higher education, as well as other state agencies.

EDNET is managed by the Utah Education Network (UEN) Consortium through the University of Utah as a role assignment from the State Board of Regents. The Consortium has representation from colleges and universities, applied technology centers, school districts, the private sector, and Community and Economic Development. The UEN Consortium also manages other telecommunications systems such as ITFS, satellite services, and KULC-TV, a statewide non-PBS educational television station that last year enrolled 2,100 college and university students in credit courses and broadcast more than 2,500 hours of core-curriculum instructional programming to

Utah's K-12 students. This is in addition to six hours of daily public school programming and numerous higher education telecourses offered by KUED-TV, the University of Utah PBS educational television station.

Legislation is now being prepared to expand the EDNET system to all rural Utah high schools, which will more than double the capacity of the system. Studies are underway to evaluate available distribution systems at each site and determine whether extended microwave or private phone company circuits will best meet local needs. Where private phone services are available, reliable, and cost effective, they will be used to extend the current microwave system through negotiated partnerships. It is anticipated that future urban high school EDNET connections will come through the fiber optic distribution systems of U S WEST or other carriers.

Utah State University uses electronic distance education to provide degree programs at 16 sites across the state, including the state prison. The USU COMNET system is a pioneer in the use of audiographics technology. A recently opened satellite uplink at USU also provides access to national agricultural AG-SAT programming.

WYOMING

Submitted by John Wubben

Legislation

The 1991 Wyoming Legislature passed what has become known as the higher education omnibus bill (enrolled act no. 121), which contains the requirement that a six-member planning team of representatives from the University of Wyoming, Community College Commission, and Department of Education be formed to develop and maintain a state plan for telecommunications based distance learning. The state telecommunications division is to provide technical and consulting support to the team, whose recommendations are due each December to the legislature.

Distance Learning Team

As mandated by enrolled act no. 121, the Distance Learning Team (DLT) has been meeting and has identified a number of objectives:

- Reviewing the necessity of current boards and developing a single governing board for distance learning, consisting of educators at all levels and representatives of other executive branch agencies to oversee video delivery system(s) for distance learning, and to address such questions consolidated budgets and the location of administration.
- Communicating to the State Board of Education the DLT mission and requesting the Board to advise the DLT of school district activities in distance learning.
- Cataloguing existing available distance learning activities and materials.
- Identifying potential business use of a state system.
- Expanding on a statewide basis the Wyoming public broadcasting system.
- Defining capacity requirements for compressed video and developing a budget for expansion of this delivery mechanism.
- Developing technical and curricular training for faculty.

- o Developing technical standards for the system which accommodate present installations and provide options for two-way interactive video.

- o Develop strategies for expansion of private sector and public support for expanded telecommunications services.

Video Education Interactive Network

US West has funded a proposal from the Wyoming School/University Partnership (at U.W.) in the amount of $304,000 to develop two multi-purpose initiatives:

- o A compressed video mentoring/coaching model for student teachers and a combined support system for first and second year teachers.

- o Two programs designed to simultaneously meet preservice and inservice needs in areas such as instructional design and new approaches to teaching mathematics.

The initiatives will be developed--using compressed video primarily--by teams of public school teachers, community college adjunct faculty, UW faculty, teachers from the Wyoming Centers for Teaching and Learning, and some students who have recently completed student teaching.

Planning for Statewide Microwave Network/Expansion of PBS System

This effort involves the coordinated efforts of the Governor's office (State Telecommunications Division), Distance Learning Team and others to implement the following steps to effect a statewide PBS system (described in a map/diagram in the 1990 Wyoming report to the WCET):

- o Hiring an engineering consultant.
- o Completing the system design.
- o Seeking federal/state funding.
- o Coordinating with cable operators.
- o Developing a Wyoming public broadcasting foundation.

These steps should be complete by spring, 1992.

Wyoming Educational Trust Fund Grant for Compressed Video

Together the state and UW have pledged $964,456 through FY93 to implement five steps in expanding UW's outreach programming through telecommunications:

- o Video linkages from UW to the seven community colleges. This involves locating compressed video equipment at UW and each of the community colleges and using state telecommunications network T-1 facilities (which are also used for statewide data transmission as well).

- o Wyoming school/university partnership video connections. This is referenced above under a separate heading and also involves 11 school districts which have each agreed to purchase compressed video equipment.

- o Expanding CARL (Colorado Alliance of Research Libraries, which includes other states such as Arizona and Hawaii as well) information and data access. Included here is the placing of equipment (terminal, printer, fax machine, appropriate furniture) at each of the community college libraries, funding for access/line charges, and covering related expenses to provide greater statewide access to the CARL

database. This will be used by UW outreach students and other individuals desiring access to the system.

- Enhancing data transmissions to and from UW. This enables faculty, staff, and students at Wyoming community colleges to have the same access to INTERNET as found on the UW Laramie campus.

- Cooperative extension service and Ag-Sat programming. Ag-Sat is a consortium of 33 land-grant institutions working together to provide college courses, cooperative extension non-credit programming, shared research findings and international services. This system will provide downlink capabilities at UW and to central receiver sites at extension offices in 23 counties and the Wind River Reservation, as well as to individual home satellite receivers.

Distance Delivery via Audiographics

Some community colleges (Laramie County and Eastern Wyoming) have expanded distance delivery (primarily nursing instruction) through audiographics. This is seen as an interim technological step, pending continuing upgrades of the state telecommunications lines and the acquisition of equipment for the implementation of compressed video.

Continued Expansion of Telecourse Efforts

Community colleges continue to expand their telecourse offerings (produced primarily by vendors) and enrollments. UW's telecourses (produced primarily in-house) will continue expanding through the new compressed video network.

1992 Legislative Outlook

The Governor and the 1991 legislature laid the groundwork for continued/enhanced state commitments to distance delivery and telecommunications. The recommendations of the Distance Learning Team, the Postsecondary Education Planning and Coordinating Council, and the Statewide Information Advisory Council--all building on the various 1991 appropriations related to telecommunications--will be used in shaping further legislation and/or funding for Wyoming educational telecommunications.